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Internal Letter **Rockwell International**

Date · June 14, 1988 No. ·

TO (Name, Organization, Internal Address)
· T. C. Greengard
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ADMIN RECORD

FROM (Name, Organization, Internal Address, Phone)
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SUBJECT· Potential Options for Remediating Radioactively Contaminated Soil at Rocky Flats

This letter briefly summarizes the potential options available for decontaminating Rocky Flats soil containing actinides (e.g., uranium, plutonium, and americium). The information contained herein is the result of a review of the literature, plus discussions with vendors and personnel at Rocky Flats and other DOE facilities.

We found that the various soil decontamination techniques could be grouped, roughly, into four categories (options). Brief explanations of these categories follow with no indication of preference.

1. Do nothing and/or build containment structures around the deposits. A do nothing alternative may be appropriate if the contamination poses no risk to the environment or general public, or if the risks to decontamination workers, environment, or public during remediation activities far outweigh the benefits of remediation. Containment structures such as caps or slurry walls could be added to further limit the spread of contamination.

2. Removal and shipment of the soil to an off-site disposal facility. Soil exhumed from the contaminated sites would have to be placed in containers before shipment. Additional treatment of the soil could be required before packaging. Treatment could take the form of solidification, using a process such as a glass melter, or encapsulation, using materials such as cement, bitumen, or resins.

3. Soil decontamination. Rocky Flats has investigated several techniques (common to the minerals industry) for decontaminating soil. The primary objective is volume reduction. The process concentrates the radioactive particles in a small fraction of the soil, with the intent of returning the remaining decontaminated fraction to the point of origin. The contaminated portion is sent to an off-site repository for disposal (see alternative No. 2).

4. In situ treatment. These processes do not remove the contaminants but instead immobilize the radionuclides in-place, preventing the further spread of the contamination. Potential processes include in situ vitrification and grouting.

   It should be noted that precautions will be required during decontamination activities, associated with any of the options listed above, to prevent the spread of contamination and minimize the risk to workers.

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"REVIEWED FOR CLASSIFICATION"
By S.C. McGlochlin
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The preceding descriptions are deliberately brief. The intent of this letter is to encourage an awareness of the relatively limited number of options for decontaminating soils containing radionuclides, not provide detailed descriptions of the options (or decontamination processes). Also, no mention is made of the requirements for treating soils containing both radioactive and hazardous organic/inorganic substances. Efforts to decontaminate sites with radioactive contamination will be complicated if hazardous substances are present, and this could further limit the number of available options. Two factors will cause the list of options to remain incomplete. First, it is possible that decontamination techniques exist that have not come to our attention (we would appreciate any information you may have regarding decontamination technologies). However, discussions with personnel at other DOE facilities appear to support our initial list of options. Second, the hazardous waste industry is dynamic and new technologies are being developed. It is incumbent upon Rocky Flats personnel, involved with decontaminating soils, to keep current with the new technologies. For example, one company is developing an in situ leaching process for removing uranium contamination from soil. In principle, the process will be similar to in situ leaching techniques used for mining uranium. However, the person contacted estimated perhaps 2 to 3 years before the process will be generally available.

In closing, because of the relatively limited number of options for decontaminating soils, we urge all individuals involved in the effort to decontaminate soils at Rocky Flats to give equal consideration to all treatment options. WPD's efforts will be directed toward evaluating available technologies, while being cognizant of the need to address safety, efficiency, and cost.

Call if you have any questions.

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